Kaohsiung Journal of Medical Sciences (2016) 32, 514–517

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: http://www.kjms-online.com

ORIGINAL ARTICLE

Impact of positive surgical margin on biochemical recurrence following radical prostatectomy in locally advanced prostate cancer

Cavit Ceylan [a], **Senol Tonyali** [a,*], **Ibrahim Keles** [b]

[a] *Department of Urology, Clinic of Türkiye Yüksek Ihtisas Training and Research Hospital, Ankara, Turkey*
[b] *Department of Urology, Afyon Kocatepe University, Faculty of Medicine, Afyon, Turkey*

Received 6 May 2016; accepted 12 August 2016
Available online 9 September 2016

KEYWORDS
Biochemical recurrence;
Prostate cancer;
Prostate-specific antigen;
Radical prostatectomy;
Surgical margin

Abstract This study aimed to determine the effect of surgical margin positivity on biochemical recurrence (BCR) in patients with locally advanced prostate cancer (PCa) who underwent radical retropubic prostatectomy (RRP). The medical records of all patients with locally advanced PCa that underwent RRP were retrospectively reviewed. Patient demographics, digital rectal examination findings, prostate biopsy Gleason score, prostate volume, pre- and post-treatment prostate-specific antigen (PSA) levels, definitive pathology Gleason score, surgical margin status, seminal vesicle invasion, perineural invasion, absence or presence of BCR, and the time to BCR were analyzed. The study included 130 patients. The final pathologic examination showed that seven (5.4%) patients had T3a disease and 123 (94.6%) had T3b disease. In all, 93 (71.5%) patients had a positive surgical margin [SM(+)], whereas 37 (28.5%) patients had a negative surgical margin [SM(−)]. Among the seven patients with pT3a disease, four (57.1%) had SM(+), whereas 89 (72.4%) of the 123 patients with pT3b disease had SM(−). BCR occurred in 11.8% (11 of 93) of patients with SM(+) and in 45.9% (17 of 37) of those with SM(−) ($p < 0.001$). Multivariate logistic regression analysis showed that SM(+) was the only significant predictor of BCR following RRP (relative risk, 0.163; 95% confidence interval (0.062–0.433); $p < 0.001$). SM(+) in RRP specimens is not always indicative of BCR in patients with locally advanced PCa. RRP should be considered an effective treatment choice for selected patients with locally advanced PCa, despite the associated high SM(+) rate.

Conflicts of interest: All authors declare no conflicts of interest.

* Corresponding author. Turkiye Yuksek Ihtisas Egitim ve Arastirma Hastanesi, Uroloji Klinigi, 06230, Sihhiye, Ankara, Turkey.
E-mail address: senoltonyali@hotmail.com (S. Tonyali).

http://dx.doi.org/10.1016/j.kjms.2016.08.007

Introduction

Prostate cancer (PCa) is the most common solid neoplasm in males in Europe, with an incidence of 214 cases per 1000 males [1]. Both genetic and epigenetic factors play a role in the etiopathogenesis and progression of PCa [1,2]. Radical prostatectomy (RP) is the most common treatment in patients with localized PCa and a life expectancy >10 years. Despite the favorable rate of cancer control associated with RP, approximately 25% of all patients [3] and ≤60% of patients with locally advanced PCa that undergo RP experience biochemical recurrence (BCR) within 10 years of treatment [4].

The prostate biopsy Gleason score (GS) and pretreatment serum prostate-specific antigen (PSA) level are well-known predictors of BCR following RP [5,6]. Surgical margin positivity (SM+), which occurs in ≤38% of patients who undergo RP, is also thought to be associated with BCR [6]. The present study aimed to determine the effect of SM+ on BCR in patients with locally advanced PCa that underwent radical retropubic prostatectomy (RRP).

Material and methods

The medical records of all patients with pathologically locally advanced PCa who underwent RRP between October 1, 2005 and October 1, 2015 were retrospectively reviewed. Patients with a history of neoadjuvant or adjuvant therapy for PCa were excluded from the study. The same RRP technique was performed by multiple surgeons. Extended lymph node dissection was performed in patients considered high-risk, according to D'Amico's risk classification [7].

Patient demographics, digital rectal examination (DRE) findings, prostate biopsy GS, prostate volume, pre- and post-treatment PSA levels, free/total PSA ratio, definitive pathology GS, surgical margin status, seminal vesicle invasion, perineural invasion, presence of BCR, and time to BCR were analyzed. BCR was defined as a post-RRP PSA level ≥ 0.2 ng/mL [8]. BCR was stratified as early (occurring within 1 year of RRP) and late (occurring >1 year after RRP). Suspected extraprostatic extension based on DRE was defined as DRE positive (+) and the absence of extraprostatic extension in DRE was defined as DRE negative (−).

Statistical analysis was performed using SPSS v.21 (IBM SPSS Statistics version 21). The study variables were investigated using visual and analytical methods (Kolmogorov–Simirnov test) to determine the normality of their distribution. Normally distributed variables are shown as mean ± standard deviation. Dual comparisons between groups were made using Student *t* test, Mann–Whitney *U* test, and Chi-square test. Multivariate logistic regression analysis was used to identify the factors associated with BCR. The level of statistical significance was set at $p < 0.05$.

Results

The study included 130 patients with locally advanced PCa who underwent RRP. The mean age of the patients was 64.30 ± 6.03 years, and the mean preoperative PSA level was 8.74 ± 6.16 ng/mL. The final pathologic examination showed that seven (5.4%) of the patients had T3a disease and 123 (94.6%) had T3b disease. Additionally, perineural invasion was observed in 67 (51.5%) patients.

In all, 93 (71.5%) of the patients had SM(+), versus 37 (28.5%) who had SM(−). There were no significant differences in mean age, preoperative PSA level, preoperative prostate biopsy GS, prostate volume, or free/total PSA ratio between SM(+) and SM(−) patients, whereas the final pathology GS was significantly lower in SM(+) patients than in SM(−) patients ($p = 0.001$; Table 1). In total, four (57.1%) of the seven patients with pT3a disease had SM(+) and 89 (72.4%) of the 123 patients with pT3b disease had SM(−).

Among the 130 patients, 28 had BCR after RRP: 12 patients had early BCR, versus 16 with late BCR. BCR occurred in 11.8% (11 of 93) of patients with SM(+) and in 45.9% (17 of 37) of patients with SM(−); the difference was significant ($p < 0.001$). There was no significant difference in the mean time to BCR after RRP between SM(+) patients (17.36 ± 14.37 months) and SM(−) patients (19.65 ± 12.8 months). The mean follow-up period after RRP in all patients was 32 ± 17.08 months (range, 7–90 months), whereas the patients without BCR had a mean follow-up of 30.6 ± 17.4 months (range, 7–90 months).

Multivariate logistic regression showed that SM(+) was the only significant predictor of BCR after RRP (relative risk, 0.163; 95% confidence interval (0.062–0.433); $p < 0.001$) rather than DRE, lymph node involvement (LNI), seminal vesicle involvement (SVI), or perineural invasion (PNI). Moreover SM(+) was associated with PNI ($p = 0.001$), but not with DRE, LNI, or SVI (Table 2).

Suspicion of extracapsular extension based on DRE was noted in 34 (26.2%) patients. There were not significant differences in mean age, PSA level, prostate volume, or the free/total PSA ratio between the DRE(+) and DRE(−) patients; however, there was a significant difference in preoperative prostate biopsy GS and final pathology GS ($p < 0.001$ and $p < 0.001$, respectively). The time to BCR after RRP was significantly longer in DRE(−) patients ($p = 0.001$). Furthermore, there was a positive correlation between DRE(+) and final pathology GS ($p < 0.001$); however, DRE(+) was negatively correlated with SVI ($p < 0.001$).

Table 1 Patient characteristics according to SM status.

	SM(−)	SM(+)	*p*
No. of patients ($n = 130$)	37 (28.5%)	93 (71.5%)	
Age ± SD (y)	64.86 ± 5.55	64.08 ± 6.23	0.5
PSA (ng/mL)	9.56 ± 7.56	8.41 ± 5.51	0.15
Biopsy GS	6.33 ± 0.81	6.28 ± 0.82	0.7
Final pathology GS	6.99 ± 0.9	6.33 ± 0.85	0.001
Prostate volume	38.27 ± 15.99	39.52 ± 14.49	0.66
Free/total PSA	13.97 ± 7.78	14.88 ± 6.92	0.51
Time to BCR ± SD (min)	19.65 ± 12.8	17.36 ± 14.37	0.52

BCR = biochemical recurrence; GS = Gleason score; PSA = Prostate-specific antigen; SD = standard deviation; SM = surgical margin.